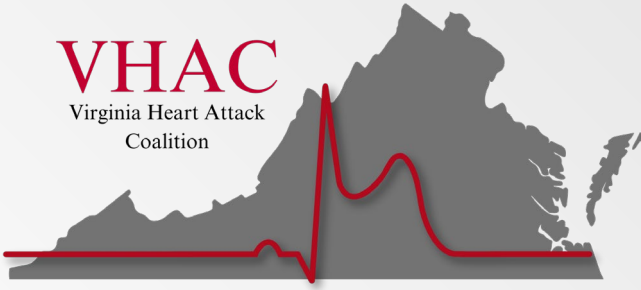**VHAC**
Virginia Heart Attack Coalition

ECG Education

BACK TO BASICS OF CLEAN ECG ACQUISITION AND INCREASING STEMI ACCURACY AND SENSITIVITY

Proud partner of ✓CSQI

"Democracy will fail if the people are not educated"

Thomas Jefferson

Introduction

To develop and implement a standardized EMS training program focused on improving the identification and management of STEMI (ST-Elevation Myocardial Infarction) cases. The workgroup aims to achieve this by:

1. **Developing a Comprehensive Curriculum:** Creating a tailored curriculum that addresses the specific challenges EMS personnel face in EKG acquisition, interpretation and STEMI identification.

2. **Collaborating with Hospital Facilities:** Enhancing the continuum of care for STEMI patients by fostering stronger communication and collaboration between EMS and hospital facilities.

3. **Utilizing Existing Resources:** Leveraging existing curriculum materials, with modifications as necessary, to expedite the development process.

4. **Data Analysis and Potential Publication:** Collecting and analyzing data from the training program, with the potential to publish findings and contribute to the field's knowledge base.

5. **Pilot Testing and Refinement:** Conducting a pilot class to test the curriculum, gather feedback, and refine the program before broader implementation

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Out-of-Hospital 12-Lead ECGs

An important and key component of STEMI systems of care is the performance of out-of-hospital 12-lead ECGs with transmission or interpretation by EMS providers and with advance notification of the receiving facility. Use of out-of-hospital 12-lead ECGs has been recommended by the AHA Guidelines for CPR and ECC since 2000 and has been documented to reduce time to reperfusion with fibrinolytic therapy. More recently, out-of-hospital 12-lead ECGs have also been shown to reduce the time to primary PCI and can facilitate triage to specific hospitals when PCI is the chosen strategy. When EMS or ED physicians activate the cardiac care team, including the cardiac catheterization laboratory, significant reductions in reperfusion times are observed.
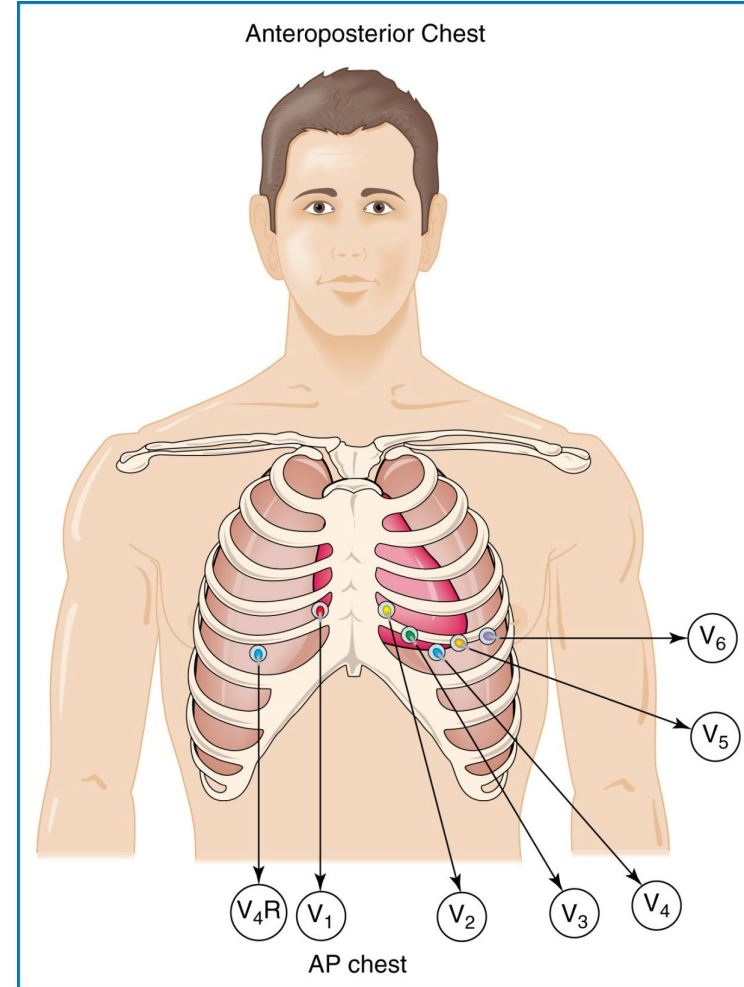
Overview of the Science and/or Guidelines

From AHA Mission LifeLine Guidelines

Class 1 Recommendation!

Overview of the Science and/or Guidelines

- Diagnostic 12/15 Leads are essential for STEMI/OMI recognition

- Proper Lead Placement Critical

- Clean 12/15 Leads that are free of artifact

- Increased sensitivity for ECG STEMI/OMI recognition (15 Leads) and serial 12 leads and other novel criteria.

Anteroposterior Chest

V_6
V_5
V_4R V_1 V_2 V_3 V_4

AP chest

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Current Practice

- Almost all Virginia EMS Agencies (ALS) are 12 Lead capable.

- While EMT and AEMT can "run a 12 lead" only Paramedics can interpret 12 Leads for STEMI

- Standard EMS Curriculum does not test competency in 12 lead interpretation skills or acquisition.

- Silos have developed across the commonwealth: some exceptional training centers and others don't have a training officer.

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Vision

- We will develop a well-designed policy/procedure or protocol for 12/15 Lead ECG acquisition.

- We will produce and make available to all a standardized course for STEMI recognition for BLS and ALS providers.

- A competency tool is needed for STEMI recognition.

- Continuing education and ongoing Quality Improvement is necessary to continue growth of the program.

- This mission is open ended as turnover and new personnel are entering the workforce

Vision

Workgroup's vision for addressing gaps and opportunities

Long-term goals and objectives

Standardization of EMS Training

Curriculum Development with Specific Focus

Strengthening EMS-Hospital Collaboration

Leveraging Data for Continuous Improvement

Expanding Impact through Publication and Dissemination

Pilot Testing and Iterative Development

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Fundamentals of 12-Lead ECG Acquisition and STEMI Recognition for Emergency Responders Syllabus

Time Frame	2-3 hours, with additional time allocated for hands-on practice in small groups. Includes 1 hour of lecture, 1 hour of hands-on practice, and 30 minutes to 1 hour of assessments and Q&A sessions.
Audience	Primarily designed for BLS providers, this course also includes a module tailored for ALS providers to foster interdisciplinary collaboration.
Synopsis	This course integrates practical skills with real-world applications, offering emergency responders the knowledge to accurately acquire 12/15 lead ECGs and identify STEMI, significantly improving patient outcomes. Through interactive case studies and evidence-based practices, participants will learn the critical role of early diagnosis in the chain of survival.
Overall Objective	To equip healthcare providers with the necessary skills for effective 12/15 lead ECG acquisition and STEMI identification, emphasizing the direct impact on patient survival rates and highlighting the importance of swift, coordinated care delivery.
Objectives	By the end of the session the student will be able to: 1. Describe the process of coronary artery occlusion that leads to a myocardial infarction. (What) 2. Describe common signs and symptoms and risk factors for AMI. (Who) 3. Describe the value of early 12/15 lead ECG acquisition as it relates to the 3 Keys to quality STEMI systems of care. (Recognition, Activation, Intervention) (Why) 4. Describe or demonstrate proper site preparation, lead placement location and validation of a 12/15 lead ECG. (How) 5. Give a 12/15 lead ECG and using a simple algorithm, recognize ECG evidence of STEMI. (recognition) 6. Identify and correct common artifacts and errors in ECGs, enhancing accuracy in readings and troubleshooting skills.
Core Skills	• Proper Skin Preparation • Correct Lead Placement for a *diagnostic* 12 Lead • Validation Technique • Individual machine competency (Local area) • STEMI / No STEMI recognition • Effective Communication with Receiving Facilities • Best Practices in ECG Documentation and facilitating seamless patient handovers.
Methodology	The course methodology is enriched with interactive case studies, simulations, and practical exercises, alongside traditional lectures and multimedia presentations, to ensure a comprehensive learning experience.

This course is brought to you by:

Syllabus

Framework document is available

Next Steps

Finish (and Trial) the Course/PowerPoint

Skills check-off (competency) sheets for core skills and practice library of 12/15 Leads

Develop instructors and distribution options (web site and asynchronous)

Initiative: Increased Sensitivity with 15 Leads

A ssessing the Diagnostic Value of an ECG Containing Leads V_{4R}, V_8, and V_9: The 15-Lead ECG

From The Research Program, Department of Emergency Medicine, Cook County Hospital;* The Program in Emergency Medicine, College of Medicine,† and School of Public Health,‡ University of Illinois, Chicago; and the Emergency Department and Division of

Robert J Zalenski, MD, FACEP*†‡
David Cooke, MD, FACS§
Robert Rydman, PhD*‡
Edward P Sloan, MD, FACEP*†
Daniel G Murphy, MD*

Study objectives: To assess sensitivity, specificity, and odds ratios of ECG findings on leads V_{4R}, V_8, and V_9 for acute myocardial infarction.

Design: Prospective, two-stage cohort study.

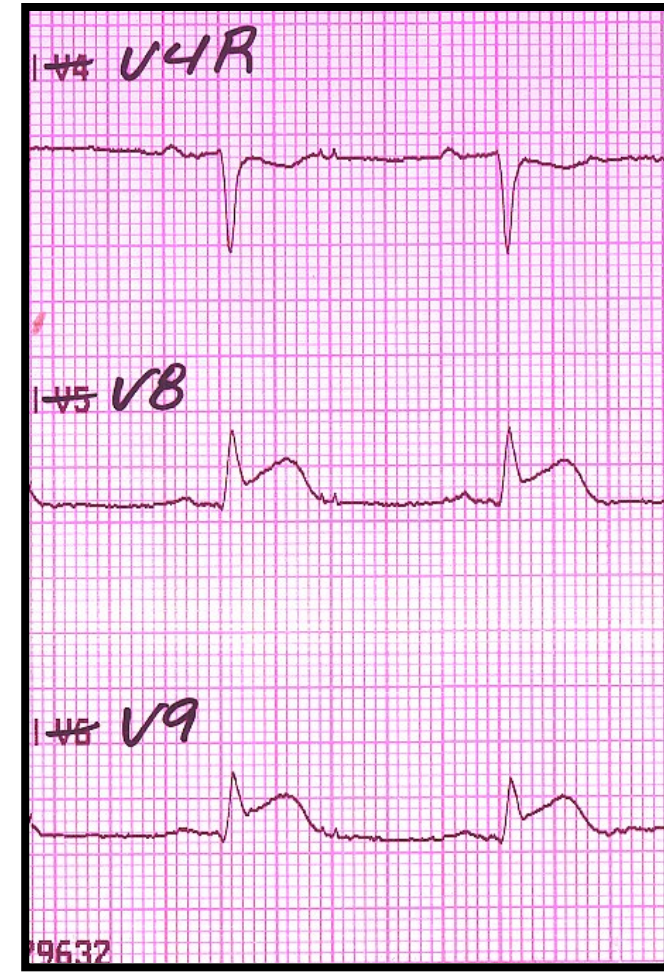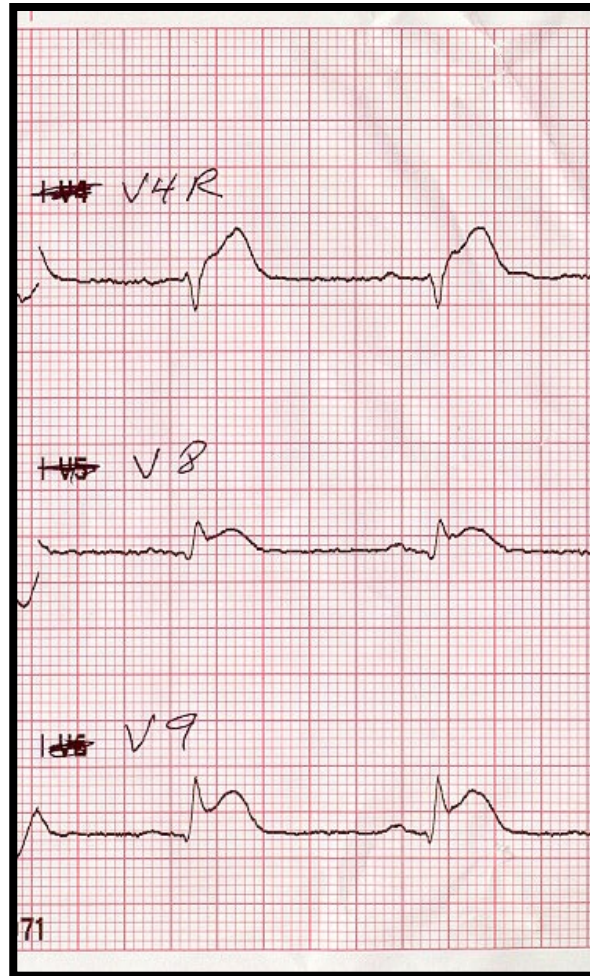Setting: A 660-bed university-affiliated community hospital.

PWMI and RVI with a 15 lead ECG

23% increase in sensitivity for RCA

86% increase in sensitivity with CIRC

88% Sensitivity for RVI

These folks would not be discovered without a 15 lead!

Increased Sensitivity

	Sensitivity 1 (12 leads)	Sensitivity 2 (15 leads)	Δ
Group I	13%	32%	+19%
Group II	21%	86%	+65%
Group III	47%	86%	+39%

percutaneous transluminal coronary angioplasty model of acute myocardial infarction. *Am J Cardiol* 2001;87:970-974

[8] Casas RE, Marriott HJL, Glancy DL: Value of leads V7-V9 in diagnosing posterior wall acute myocardial infarction and other causes of tall R wave in V1-V2. *Am J Cardiol* 1997;80:508-509

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[11] Carley SD: Beyond the 12 lead: Review of the use of additional leads for the early Electrocardiographic diagnosis of acute myocardial infarction. *Emergency Medicine* 2003;15:143-154

[12] Erhardt LR: Clinical and pathological observations in different types of acute myocardial infarction: a study of 84 patients deceased after treatment in a coronary care unit. *Acta Med Scan* 1974 (supp);560:1-78

[13] Matetzky S, Freimark D, Feinberg MS, et al.: Acute myocardial infarction with isolated ST-segment elevation in posterior chest leads V7-9: "hidden" ST-segment elevation revealing acute posterior infarction. *JACC* 1999;34:748-753

[14] Somers MP, Brady WJ, Bateman DC et al.: Additional Electrocardiographic leads in the ED chest pain patients: right ventricular and posterior leads. *Am J Emerg Med* 2003; 21:563-573

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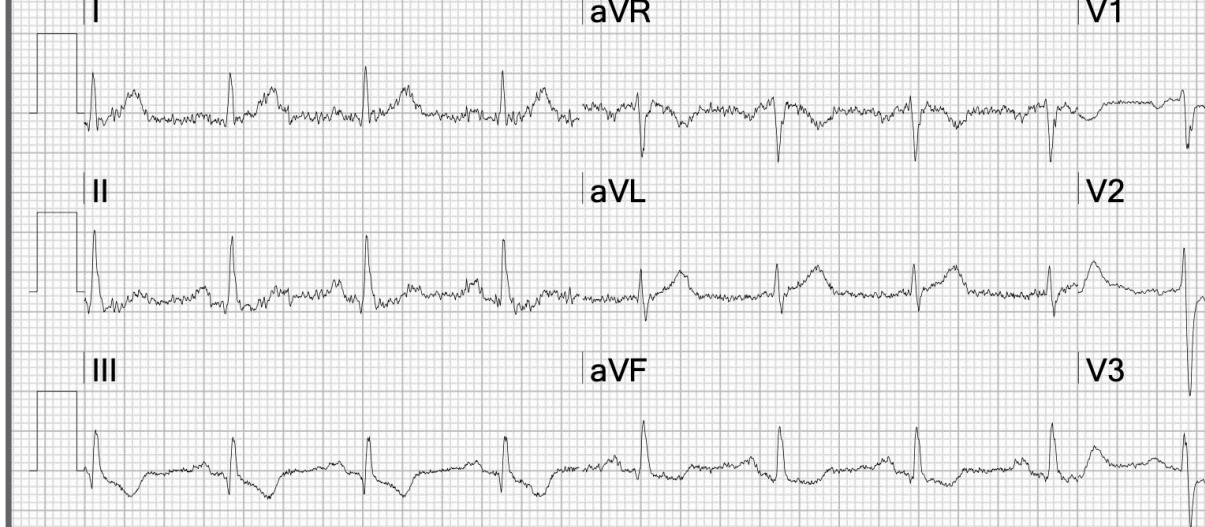[16] Taha B, Reddy S, Agarwal J, et al.: Normal limits of ST

Reality Based Medicine!
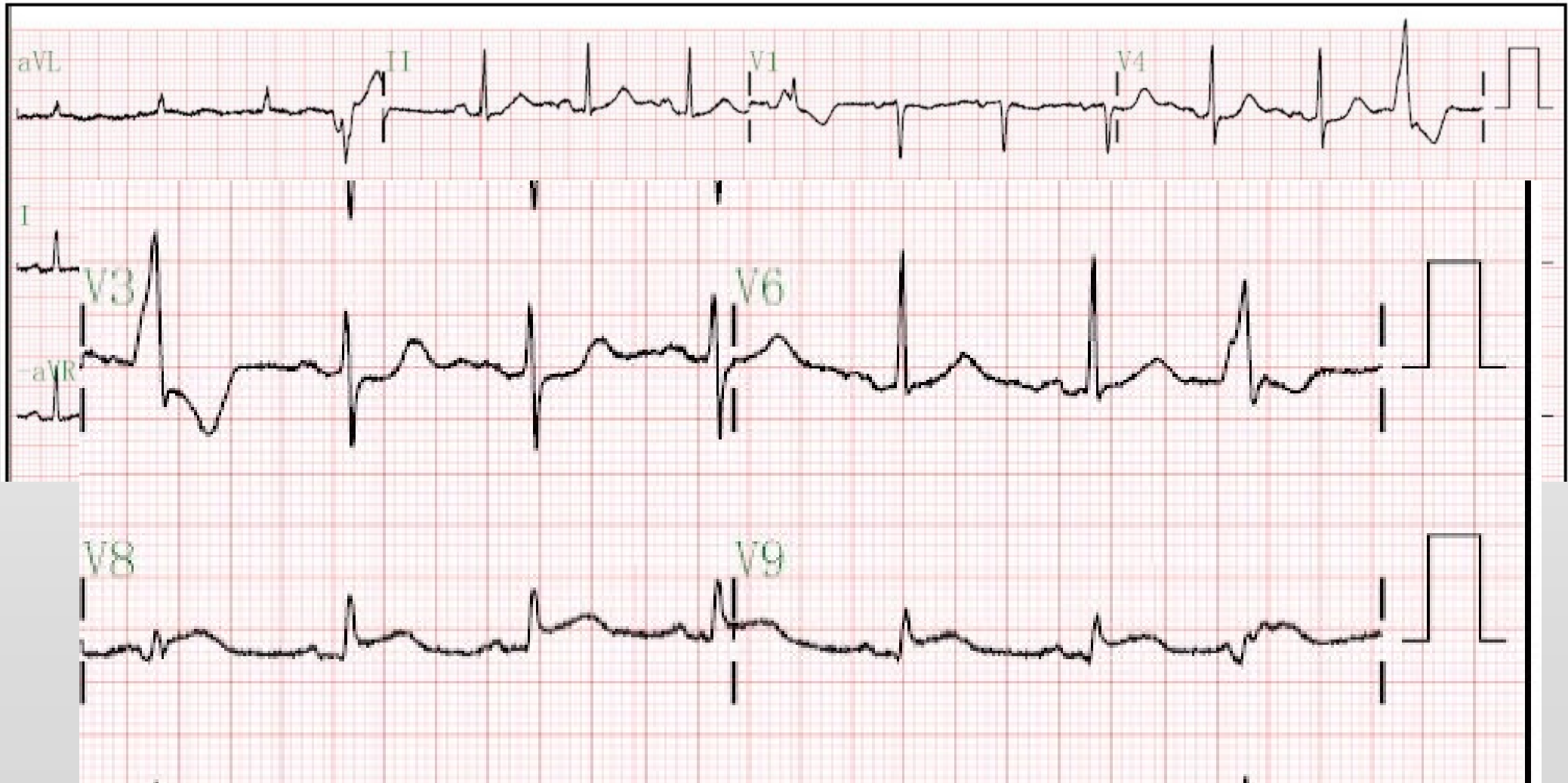
Technology/Equipment is available NOW to facilitate

Name:		12-Lead 1		HR 87bpm	Abnormal ECG
ID:	012421194054	1/24/2021		7:42:26 PM	Sinus rhythm
Patient ID:		PR 0.168s		QRS 0.092s	Inferior and ante
Incident ID:		QT/QTc:		0.344s/0.391s	
Age: 55	Sex: M	P-QRS-T Axes:		70°48°-16°	

x1.0 .05-150Hz 25mm/sec

Physio-Control Inc   Comments:
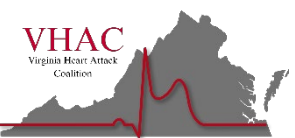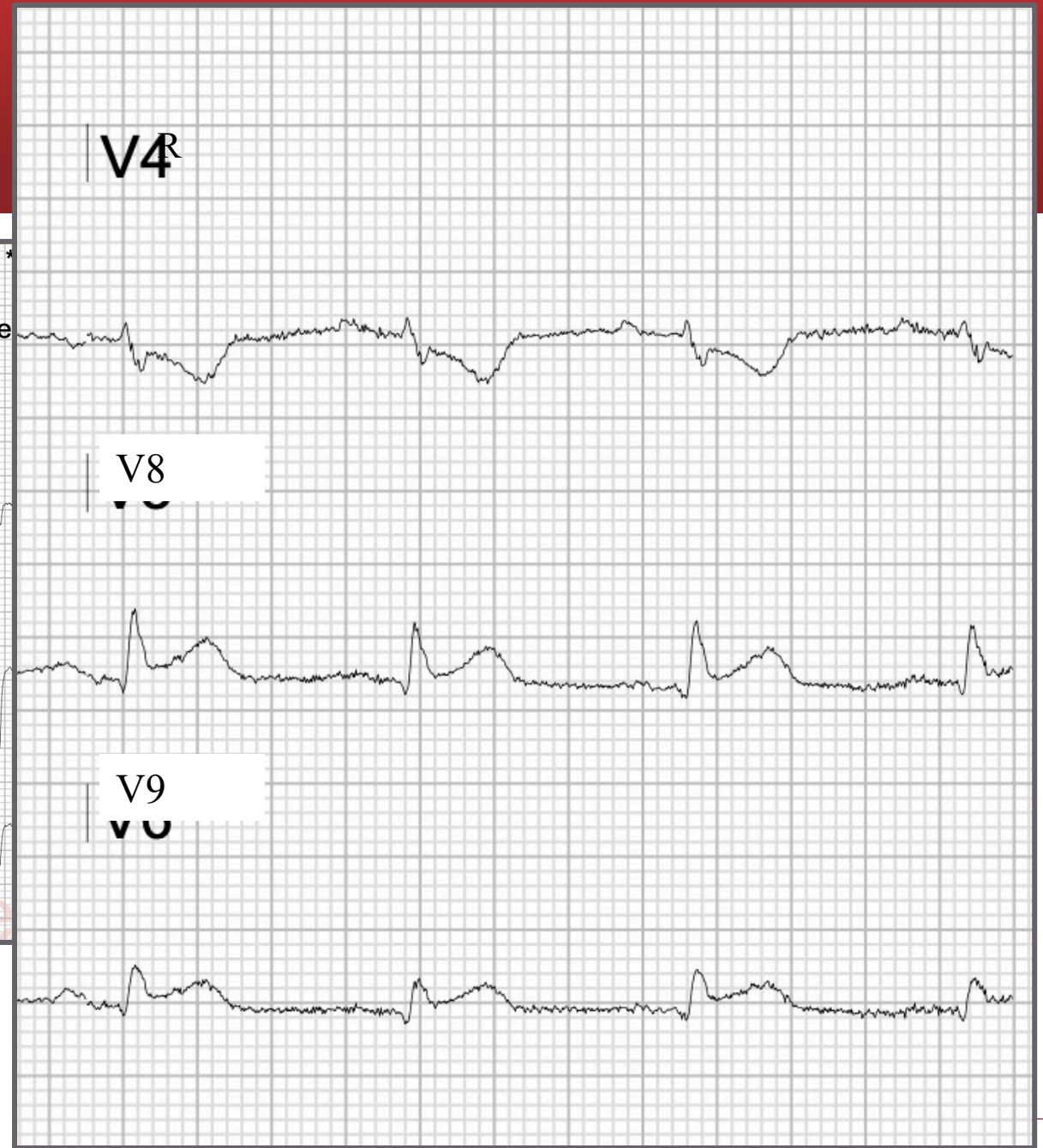
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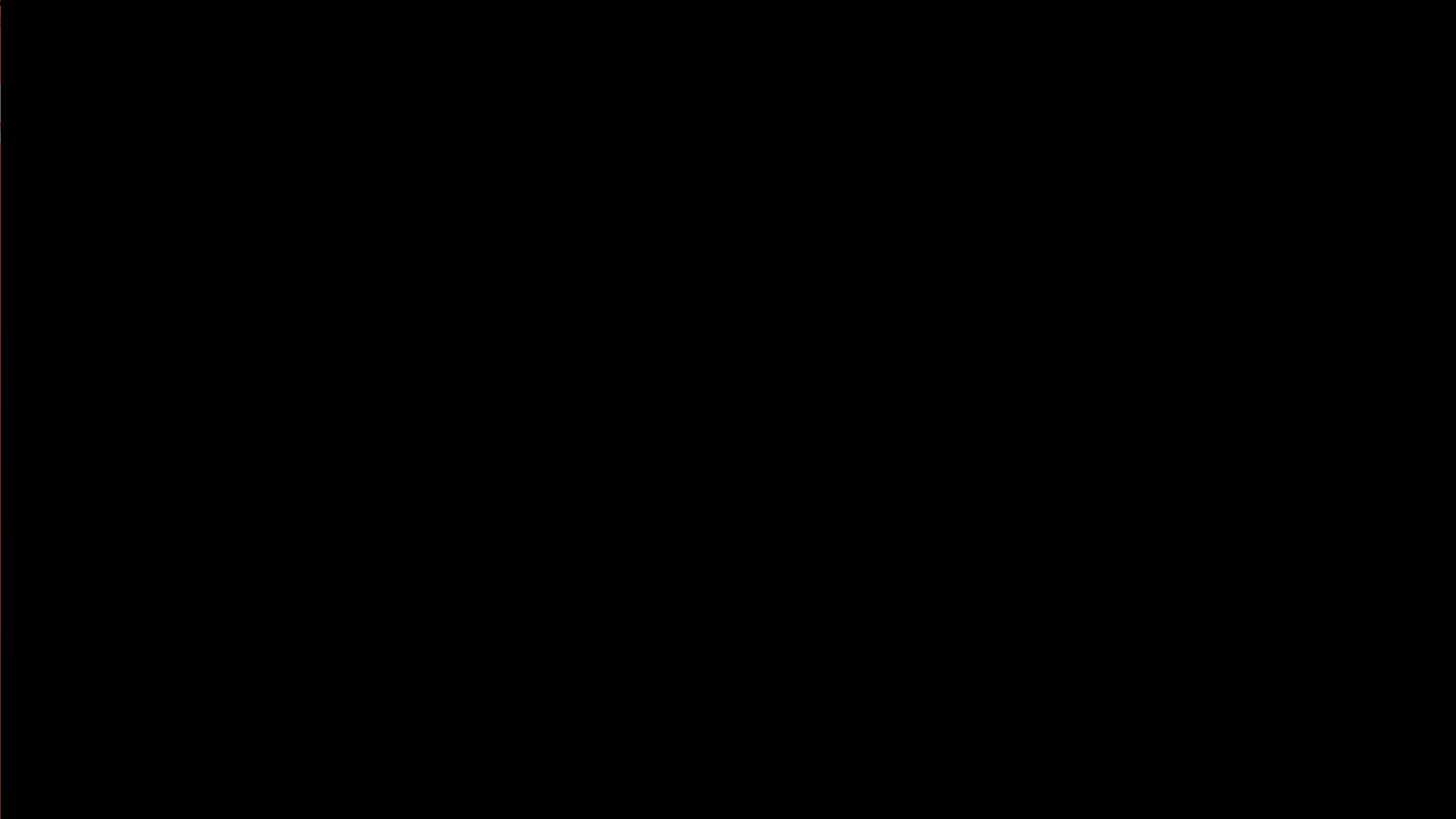
Thank You

Contact info@VCSQI.org with any question or concerns.

CLINICAL
WORKGROUP
RESOURCES

SCAN ME